

WHAT IS CLAIMED IS:

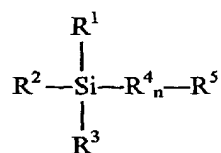
1. A method of preparing a diene-based elastomer/filler composite which comprises

(A) polymerizing at least one conjugated diene hydrocarbon selected from isoprene, 1,3-butadiene and mixtures thereof or copolymerizing at least one conjugated diene selected from isoprene and 1,3-butadiene, and mixtures thereof, styrene in an organic solvent and in the presence of at least one treated particulate filler selected from at least one of precipitated silica, and modified carbon black

(B) terminating the polymerization reaction; wherein said elastomer composite contains from about 10 to about 100 phr of said filler;

wherein said treated filler is treated by

(1) first treating said filler to silanize said filler with an organosilane of the general formula (I):



wherein  $\text{R}^1$ ,  $\text{R}^2$  and  $\text{R}^3$  are equal or individually and independently selected from  $\text{CH}_3$ -, H-, Cl- and  $(-\text{OR}^6)$  and  $\text{R}^6$  is individually selected from methyl, ethyl and propyl radicals,  $\text{R}^4$  is a  $-\text{CH}_2$ - radical, n is an integer of zero or one, wherein if n is one then  $\text{R}^4$  is selected from an aryl radical, an alkenylaryl radical, an alkenylarylalkyl radical or an alkylaryl radical, and  $\text{R}^5$  is selected from an  $-(\text{CH}=\text{CH}_2)$  radical, an acrylate or a methacrylate radical followed by

(2) treating said silanized filler with said a polymerization initiator selected from butyl lithium, tetramethyl ethylenediamine, or a peroxide initiator of organic solvent anionic or radicalar polymerization, as the case may be, diene-based monomer polymerizations.

2. The method of claim 1 wherein said said polymerization initiator is selected from at least one of:

(B) butyl lithium

(B) tetramethyl ethylenediamine, or

(C) a peroxide selected from at least one of tert-butyl-hydroperoxide and dicumyl peroxide,  $\text{Fe}^{++}/\text{Fe}^{+++}$  originating from  $\text{FeSO}_4$  or  $\text{Fe}_2(\text{SO}_4)_3$ , respectively, ammoniumperoxodisulfate, bis-(tert-butyl peroxide) and benzoic acid peroxide.

5

3. The method of claim 1 wherein said initiator is butyl lithium.

4. The method of claim 1 wherein said initiator is tetramethyl ethylenediamine.

10

5. The method of claim 1 wherein said initiator is a peroxide selected from tert-butyl-hydroperoxide and dicumyl peroxide,  $\text{Fe}^{++}/\text{Fe}^{+++}$  originating from  $\text{FeSO}_4$  or  $\text{Fe}_2(\text{SO}_4)_3$ , respectively, ammoniumperoxodisulfate, bis-(tert-butyl peroxide) or benzoic acid peroxide.

15

6. The method of claim 1 wherein said organosilane is selected from the group consisting of 3-acryloxypropyl-trimethoxy silane, methacryloxymethyl trimethoxy silane, methacryloxymethyl triethoxy silane, methacryloxymethyl trimethyl silane, allyltriethoxysilane, allyltrimethoxysilane, 5-(biscycloheptenyl)triethoxysilane, 3-butenyltriethoxysilane, [2-(3-cyclohexenyl)ethyl] trimethoxysilane, 3-(cyclopentadienylpropyl)triethoxysilane, 3-acryloxypropyl-methyldichlorosilane, 3-acryloxypropyl-dimethylmethoxysilane, 3-acryloxypropyl-trichlorosilane, allylmethyldichlorosilane, allyldimethylsilazane, 5-(biscycloheptenyl)dimethylchlorosilane, 3-butenylmethyldichlorosilane, [2-(3-cyclohexenyl)ethyl] dimethylchlorosilane, [2-(3-cyclohexenyl)ethyl] trichlorosilane, 3-(cyclopentadienyl)trimethylsilane, and styrylethyl trimethoxysilane.

20

25

7. The method of claim 1 wherein said filler is a precipitated silica.

30

8. The method of claim 1 wherein said modified carbon black is a carbon black which has been treated to contain at least one moiety selected from silanol, siloxane, titanium oxide, titanium hydroxide, zirconium oxide, zirconium hydroxide and aluminum hydroxide groups on the surface thereof.

9. The method of claim 1 wherein said modified carbon black contains at least one of allyl and vinyl groups on the surface thereof, wherein said allyl groups are selected from methyl allyl or propyl allyl groups, and said vinyl groups are selected from methyl vinyl and propyl vinyl groups.

5

10. An elastomer/filler composite prepared by the method of claim 1.

11. An elastomer/filler composite prepared by the method of claim 2.

10

12. An elastomer/filler composite prepared by the method of claim 6

15

13. A rubber composition comprised of said elastomer/filler composite of claim 10 and at least one additional elastomer selected from polymers of isoprene, 1,3-butadiene and mixtures thereof and copolymers of isoprene, 1,3-butadiene and mixtures thereof with styrene.

20

14. A rubber composition comprised of said elastomer/filler composite of claim 11 and at least one additional elastomer selected from polymers of isoprene, 1,3-butadiene and mixtures thereof and copolymers of isoprene, 1,3-butadiene and mixtures thereof with styrene.

25

15. A rubber composition comprised of said elastomer/filler composite of claim 12 and at least one additional elastomer selected from polymers of isoprene, 1,3-butadiene and mixtures thereof and copolymers of isoprene, 1,3-butadiene and mixtures thereof with styrene.

30

16. An article of manufacture having at least one component of a rubber composition comprised of the elastomer/filler composite of claim 10.

30

17. A tire having at least one component of a rubber composition comprised of the elastomer/filler composite of claim 10.

18. A tire having at least one component of a rubber composition comprised of the rubber composition of claim 13.

5 19. A tire having a tread of a rubber composition comprised of the elastomer/filler composite of claim 11.

20. A tire having a tread of a rubber composition comprised of the rubber composition of claim 13.

2025-10-10 10:05:00